Scope of Work

Lake Granger Watershed Planning and Implementation Project

1. Project Title: Lake Granger Watershed Assessment and Implementation Project.

2. General Project Goals/Objectives: 1) Facilitate the development of a watershed plan for the Lake Granger Watershed. 2) Install Best Management Practices for the purpose of reducing erosion within the watershed. 3) Reduce sediment loadings by 20-30% (based on RUSLE calculations or other applicable means). 4) Reduce TSS concentration in the reservoir by 30%. 5) Reduce nutrient loadings from agricultural lands. 6) Monitor for results.

3. Project Tasks: 1.) Development a Watershed Protection Plan; 2) Implementation Best Management Practices; 3) Monitor to quantify results; 4) Compile all collected monitoring data and Implemented BMPs to produce a final report.

4. Measures of Success: 1) Development of a Watershed Protection Plan for the Lake Granger Watershed; 2) Reduction in sediment loads to Lake Granger by 20-30%; 3) Decrease the TSS concentration in Lake Granger by 30%.

5. Project Type: Statewide ( ); Watershed Implementation/Education (X); Watershed Planning and Assessment (X); Watershed Protection (X).

6. Waterbody Type: River ( ); Reservoir (X); Groundwater ( ); Other

7. Project Location: Segment 1247A - Willis Creek; Segment 1247 - Granger Lake; Segment 1248 - San Gabriel River; HUC 1207205.

8. NPS Management Program Reference: State of Texas Nonpoint Source Management Plan, approved November 1999

9. Status of Water Body: Segment 1248 - San Gabriel River: 5c for Total Dissolved Solids.

10. Key Project Activities: Hire Staff (X); Monitoring (X); Regulatory Assistance ( ); Technical Assistance (X); Education (X); Implementation (X); Demonstration ( ); Other ( ).

11. NPS Management Program Elements: Information / Education Component (4-1); Implementation of Agricultural BMPs (4-3); Regional and Watershed Projects (4-3); Formation of Strategic Partnerships (4-5)

12. Project Costs: Federal ($814,168); Non-Federal ($278,993); Total ($1,093,161)

13. Project Management: Project Manager: Texas State Soil and Water Conservation Board; Co-Leads: Brazos River Authority and Little River-San Gabriel Soil and Water Conservation Board

14. Project Period: September 1, 2005 – August 31, 2008

Problem/Need Statement:
The NRCS-WRAT Team conducted the Volumetric Survey of Lake Granger in 1995 for the Brazos River Authority. The purpose of the survey was to determine the capacity of the lake at the conservation pool elevation and to establish a baseline for future surveys. In 1980 when Granger Lake first started impounding water, initial storage calculations estimated that the volume of the lake at the conservation pool to be 65,510 acre/feet. The October 1995 survey determined the volume of the lake to be 54,280 acre/feet. The loss of 11,230 acre/feet over the 15 year life of the lake represented 17% of total storage at a rate of 748.67 acre/feet per year (1,343,095 tons of sediment /year).

In 2002 the Texas Water Development Board (TWDB) conducted a similar survey to determine the sediment loadings from October 1995 to April 2002. Results indicate a loss of 1,319 acre/feet in the 6 and ½ years between the surveys representing a loss of 202.92 acre/feet per year (364,033 tons of sediment/year). There is a distinct difference in the annual loss of volume in the lake between 1980-1995 and 1995-2002. These differences are directly related to rainfall and storm intensity.

In 1999 the NRCS-WRAT, at the request of the BRA, conducted a separate study of the Granger Lake watershed using the Soil and Water Assessment Tool (SWAT) basin model to assess flow and sediment loads and the effects of various BMPs to those sediments. Modeling results indicated that a combination of conventional conservation practices has the potential to reduce sediment loads by 20-30%. Other practices such as stream bank restoration and created wetlands were not taken into account in the study.

Williamson County is currently the fourth fastest growing county in the country. Lake Granger currently serves as a drinking water supply reservoir for approximately 20,000 residents of Williamson County. The public drinking water demands on the lake are expected to increase to exceed 100,000 residents in the next five to ten years. As the population continues to grow in this area, it becomes increasingly important to protect and preserve the water quality of Lake Granger. 1999 land use photography indicated that approximately 33% of the watershed is Brushy rangeland, 24.5% is open rangeland, 20.5% is row crop agriculture, and 11% is pasture and hayland, and the remaining 11% is Urban. While only 20.5% of the watershed is row crop, the soils and proximity of the cropland to the lake make it the main contributor to sediment loadings. Technical and financial assistance are needed to assist landowners with implementing best management practices that will reduce agricultural runoff.

The BRA owns and operates the East Williamson County Regional Water System that treats water from Lake Granger. Sedimentation into the reservoir not only threatens to

reduce the firm yield of the reservoir but also causes significant problems in treating the water. Turbidities above 200 ntu (Nephelometric turbidity units) are common with turbidity spikes exceeding 5000 ntu. Treating these high levels of turbidity to achieve the 0.1 ntu drinking water standard results in increased treatment costs that must be passed on to customers.

General Project Description

This project will provide the Little River-San Gabriel Soil and Water Conservation District (LR-SGSWCD) and the Taylor Soil and Water Conservation District (TSWCD) with funding for technical assistance and financial assistance to implement best management practices through conservation planning. A district technician working out of the Little River-San Gabriel SWCD district office will provide the technical assistance for the project. The Brazos River Authority will conduct routine and stormwater monitoring to determine and quantify the effects of the project. The NRCS and Texas Cooperative Extension will provide their technical expertise by participating on the Advisory Group.

Project Tasks:

Task 1 Development a Watershed Protection Plan: Federal ($14,219); Non-Federal ($0); Total ($14,219). The Brazos River Authority will facilitate the development of a Watershed Protection Plan for the Lake Granger Watershed

> **Subtask 1.1:** The BRA will assemble a stakeholder group that will provide input and assist in the development of a Watershed Protection Plan. The stakeholder group will meet quarterly or as needed. (September 2005 – August 2006)
>
> **Subtask 1.2:** After the completion of the Watershed Protection Plan the stakeholder group will meet annually or as needed to discuss the progress of implementation and identify alternative management measures and funding sources. (September 2006 – Project Completion)
>
> **Deliverables:** Watershed Protection Plan – BRA, Year 1
> Semi-annual meeting agendas and minutes – BRA, Semi-Annually

Task 2 Implementation of Best Management Practices: Federal ($645,730.00); Non-Federal ($166,667.00); Total ($812,397.00). The LR-SGSWCD will provide technical and financial assistance to landowners in the Granger Lake (in both the LR-SGSWCD and TSWCD) watershed to implement BMPs which will reduce soil erosion.

> **Subtask 2.1:** The LR-SGSWCD and TSWCD will determine the most applicable and cost effective BMPs to reduce sediment loadings into Granger Lake.
>
> **Subtask 2.2:** The LR-SGSWCD and TSWCD will notify producers and landowners within the Granger Lake watershed of the project and post an initial sign-up period (additional sign-up periods may be necessary).

Subtask 2.3: The LR-SGSWCD and TSWCD will accept applications for cost-share assistance, meet with the landowners/producers, and rank the applications based on average soil savings and cost effectiveness. Each conservation plan will contain RUSLE calculations to attempt to quantify soil loss savings.

Subtask 2.4: The LR-SGSWCD will assist landowners and producers with implementing conservation practices. The LR-SGSWCD will compile a list of planned and implement management practices and planned acres.

Deliverables: List of applicable BMPs – LR-SGSWCD, Month 1
Project Priority Map – LR-SGSWCD, Month 1
Compilation of BMPs planned/installed – LR-SGSWCD,Quarterly
Compilation of RULSE calculations – LR-SGSWCD, Quarterly

Task 3 Monitor to Quantify Results: Federal ($140,000); Non-Federal ($112,326); Total ($252,326). The BRA will contract with the Blacklands Research Center to conduct two Bathymetric Surveys of Lake Granger. These surveys will be compared to previous surveys to help determine the effectiveness of BMP implementation.

Subtask 3.1: The BRA will conduct routine monitoring at 4 sites through the Clean Rivers Program. This monitoring will be utilized as non-Federal match.

Subtask 3.2: The BRA will contract with the Blackland Research and Extension Center (BRC) for conduct Bathymetric Surveys of Lake Granger.

3.2.1 Blackland Research and Extension Center will develop a QMP/QAPP that will be evaluated and approved by the TSSWCB and EPA.

3.2.2 BRC conducts Bathymetric Survey – Summer 2006

3.2.3 BRC conducts follow-up survey - upon completion of major implementation activities.

Deliverables: QAPP – BRA, Month 1
Monitoring results – BRA, Quarterly
Bathymetric Surveys – Upon Completion

Task 4 Final Report: Federal ($14,219); Non-Federal ($0); Total ($14,219).
The BRA will prepare a final report which will contain all monitoring data and a compilation of BMPs and acres new enrolled in a conservation plan in order to quantify the sediment load reductions to Lake Granger.

Subtasks 4.1: The LR-SGSWCD will provide the BRA with information regarding total BMPs implemented in each sub-watershed and a compilation of RULSE calculations so the data can be included in the final report.

Subtask 4.2: The BRA will compare water quality data to implementation data in an attempt to quantify the benefits of the project.

Subtask 4.3: The BRA will prepare and distribute a final report.

Deliverables: Final Report – BRA, upon project completion

Project Coordination: The Little River-San Gabriel Soil and Water Conservation District and Taylor Soil and Water Conservation District will enter into a cooperative agreement to allow a technician in the Little River-San Gabriel SWCD provide technical assistance for both Taylor SWCD. The technician will regularly attend both SWCD meetings and give project updates. The BRA will present the results of monitoring activities on an annual basis. The Texas Cooperative Extension and NRCS will provide technical assistance.

DELIVERABLES

- Quarterly reports
- Watershed Protection Plan – BRA
- QAPP – BRA
- Semi-annual meeting agendas and minutes – BRA
- Monitoring results – BRA
- List of applicable BMPs – LR-SGSWCD
- Project Priority Map – LR-SGSWCD
- Compilation of BMPs planned/installed – LR-SGSWCD
- Compilation of RULSE calculations – LR-SGSWCD
- Final report – BRA